

## HUMAN GENETIC VARIATION

### Oklahoma Priority Academic Student Skills – Science Processes and Inquiry

Activity	Standard	Description
3	3.1	Evaluate the design of a biology laboratory investigation.
3	3.2	Identify the independent variables, dependent variables, and controls in an experiment.
2, 3	3.3	Use mathematics to show relationships within a given set of observations (e.g., population studies, biomass, probability).
3	3.4	Identify a hypothesis for a given problem in biology investigations.
3	4.1	Select appropriate predictions based on previously observed patterns of evidence.
1, 2, 3, 4	4.2	Report data in an appropriate manner.
1, 2, 3, 4	4.3	Interpret data tables, line, bar, trend, and/or circle graphs.
3	4.4	Accept or reject hypotheses when given results of a biological investigation.
1, 2, 3, 4	4.5	Evaluate experimental data to draw the most logical conclusion.
3	4.6	Prepare a written report describing the sequence, results, and interpretation of a biological investigation or event.
1, 2, 3, 4	4.7	Communicate or defend scientific thinking that results in conclusions.
1, 2, 3	4.8	Identify and/or create an appropriate graph or chart from collected data, tables, or written description (e.g., population studies, plant growth, heart rate).
4	5.1	Interpret a biological model which explains a given set of observations.
4	5.2	Select predictions based on models such as pedigrees, life cycles, energy pyramids.
4	5.3	Compare a given model to the living world.
3	6.3	Use a variety of technologies, such as hand tools, microscopes, measuring instruments, and computers to collect, analyze, and display data.
3, 4	6.4	Inquiries should lead to the formulation of explanations or models (physical, conceptual, and mathematical). In answering questions, students should engage in discussions (based on scientific knowledge, the use of logic, and evidence from the investigation) and arguments that encourage the revision of their explanations, leading to further inquiry.

<b>Oklahoma Priority Academic Student Skills – Biology</b>		
<b>Activity</b>	<b>Standard</b>	<b>Description</b>
2	1.2	Cells can differentiate and may develop into complex multicellular organisms (i.e., cells, tissues, organs, organ systems, organisms).
2, 3	2.1	Cells function according to the information contained in the master code of DNA (i.e., cell cycle, DNA to DNA, and DNA to RNA).
1, 2, 3	2.2	A sorting and recombination of genes in reproduction results in a great variety of possible gene combinations from the offspring of any two parents.
1, 2, 3, 4	3.2	Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations. Biological adaptations include changes in structures, behaviors, or physiology, which may enhance or limit the survival and reproductive success in a particular environment.
1, 2, 3, 4	6.2	Responses to external stimuli can result from interactions with the organism’s own species and others, as well as environmental changes; these responses either can be innate or learned. Broad patterns of behavior exhibited by animals have changed over time to ensure reproductive success.

**Oklahoma Priority Academic Student Skills – Mathematics Process Standards**

<b>Activity</b>	<b>Standard</b>	<b>Description</b>
2, 3, 4	1.1	Apply a wide variety of problem-solving strategies (identify a pattern, use equivalent representations) to solve problems from within and outside mathematics.
2, 3	1.2	Identify the problem from a described situation, determine the necessary data and apply appropriate problem-solving strategies.
2, 3, 4	2.1	Use mathematical language and symbols to read and write mathematics and to converse with others.
2, 3	2.2	Demonstrate mathematical ideas orally and in writing.
2, 3, 4	3.1	Use various types of logical reasoning in mathematical contexts and real-world situations.
2, 3, 4	4.1	Link mathematical ideas to the real world (e.g., statistics helps qualify the confidence we can have when drawing conclusions based on a sample).
2, 3	4.2	Apply mathematical problem-solving skills to other disciplines.

OKLAHOMA ALIGNMENT FOR NIH SUPPLEMENT HUMAN GENETIC VARIATION

2, 3	4.3	Use mathematics to solve problems encountered in daily life.
2, 3, 4	5.1	Use algebraic, graphic, and numeric representations to model and interpret mathematical and real-world situations.
1, 2, 3	5.2	Use a variety of mathematical representations as tools for organizing, recording, and communicating mathematical ideas (e.g., mathematical models, tables, graphs, spreadsheets).

**Oklahoma Priority Academic Student Skills – Algebra I**

Activity	Standard	Description
1, 2, 3	3.1.a	Translate from one representation of data to another and understand that the data can be represented using a variety of tables, graphs, or symbols and that different modes of representation often convey different messages.
1, 2, 3, 4	3.1.b	Make valid inferences, predictions, and/or arguments based on data from graphs, tables, and charts.

**Oklahoma Priority Academic Student Skills – Language Arts – Grade 10**

Activity	Standard	Description
2, 3, 4, 5	2.2.b	Draw inferences such as conclusions, generalizations, and predictions, and support them with text evidence and personal experience. (Reading)
2, 3, 4, 5	4.1.a	Access information from a variety of primary and secondary sources. (Reading)
All activities	4.2.a	Summarize, paraphrase, and/or quote relevant information. (Reading)
All activities	4.2.c	Synthesize information from multiple sources to draw conclusions that go beyond those found in any of the individual studies. (Reading)
All activities	1.2	Use extension and elaboration to develop an idea. (Writing)
All activities	1.3	Demonstrate organization, unity, and coherence by using transitions and sequencing. (Writing)
All activities	1.4	Use precise word choices, including figurative language, that convey specific meaning. (Writing)
All activities	1.5	Use a variety of sentence structures, types, and lengths to contribute to fluency and interest. (Writing)
All	2.2.a	Write expository compositions, including analytical essays and research reports that: include evidence in support

OKLAHOMA ALIGNMENT FOR NIH SUPPLEMENT HUMAN GENETIC VARIATION

<b>activities</b>		of a thesis (position on the topic) including information on all relevant perspectives.
<b>3</b>	<b>2.2.e</b>	Write expository compositions, including analytical essays and research reports that: include visual aids using technology to organize and record information on charts, data tables, maps, and graphs. (Writing)
<b>1, 2, 3, 4</b>	<b>2.2.g</b>	Write expository compositions, including analytical essays and research reports that: use technical terms and notations accurately. (Writing)
<b>All activities</b>	<b>2.8</b>	Write for different purposes and audiences, adjusting tone, style, and voice as appropriate and continue to produce other writing forms introduced in earlier grades. (Writing)
<b>All activities</b>	<b>1.1</b>	Engage in critical, empathetic, appreciative, and reflective listening to interpret, respond, and evaluate speaker’s messages. (Listening)
<b>All activities</b>	<b>1.3</b>	Evaluate informative and persuasive presentations of peers, public figures, and media presentations. (Listening)
<b>All activities</b>	<b>2.1</b>	Use formal, informal, standard, and technical language effectively to meet the needs of purpose, audience, occasion, and task. (Speaking)
<b>2, 3, 4, 5</b>	<b>2.2</b>	Prepare, organize, and present a variety of informative and persuasive messages effectively. (Speaking)

**Oklahoma Priority Academic Student Skills – Health and Safety Literacy – Grades 9 - 12**

<b>Activity</b>	<b>Standard</b>	<b>Description</b>
<b>2</b>	<b>1.3</b>	Describe the structure and function of the body systems: circulatory, digestive, endocrine, excretory, immune, muscular, nervous, reproductive, respiratory, and skeletal.
<b>4, 5</b>	<b>1.4</b>	Analyze how behavior can impact health maintenance and disease prevention.
<b>4, 5</b>	<b>1.5</b>	Describe the impact of personal health behaviors and their influence on the health of individuals.
<b>2, 3, 4, 5</b>	<b>1.6</b>	Analyze how the prevention and control of health problems are influenced by research and medical advances.
<b>2, 3, 4</b>	<b>2.1</b>	Identify sources of accurate information regarding health and safety information, products, and services.
<b>4, 5</b>	<b>2.4</b>	Evaluate factors that influence personal choices of health products and services.
<b>3, 4, 5</b>	<b>3.2</b>	Analyze how information from media, technology, and the community affects health and safety behavior.
<b>4</b>	<b>3.3</b>	Interpret and evaluate media messages and other factors on personal, family, and community health and safety.
<b>2, 4, 5</b>	<b>5.1</b>	Analyze and predict immediate and long-term impact of health and safety decisions on individual, family, school, and community.
<b>4, 5</b>	<b>5.3</b>	Demonstrate the ability to utilize various strategies when making decisions related to health needs and risks of

OKLAHOMA ALIGNMENT FOR NIH SUPPLEMENT HUMAN GENETIC VARIATION

		young adults.
<b>4, 5</b>	<b>6.2</b>	Demonstrate the ability to influence and support others in positive health and safety choices.
<b>2, 4, 5</b>	<b>6.4</b>	Utilize strategies to overcome barriers in communicating information, ideas, feelings, and opinions concerning health and safety issues.